POLYMER DIVISION MEETING at 49th IUPAC General Assembly
July 8th, 2017 (09:00-17:30)
July 9th, 2017 (09:00-16:30)

Matisse Room, Sheraton São Paulo World Trade Centre Hotel

Those attending: Ray **Bucher** (UK) NR, Chin Han **Chan** (Malaysia) NR, Claudio **dos Santos** (Brazil) NR, Christopher **Fellows** (Australia) SPEd, Jiasong **He** (China) TM, Michael **Hess** (Germany) AM, Roger **Hiorns** (France) AM, Igor **Lacik** (Slovakia) TM, Chain Shu **Hsu** (China/Taipei) NR, Robin **Hutchinson** (Canada) NR, Jan **Merna** (Czech Republic) observer, Graeme **Moad** (Australia) AM, Tamaki **Nakano** (Japan), Guido **Raos** (Italy) SPT, Greg **Russell –** Division President (New Zealand), Olga **Philippova** (Russia) NR - SPT, Natalie **Stingelin** (UK) SPT, Duyeol **Ryu** (Republic of Korea) young observer, Patrick **Theato** (Germany) SPEd, Paul **Topham** (UK) SPT, Jean-Pierre **Vairon** (France) observer, Michel **Vert** (France) observer, Jiri **Vohlidal** (Czech Republic) NR, Michael **Walter** (USA) Division Secretary, Myung-Han **Yoon** (Republic of Korea) young observer, Adriana **Sturcova** (Czech Republic) Observer – SPT, Werner **Mormann** (Germany) SPT SPED, Chris **Ober** (USA) Bureau ISML, John **Matson (**USA**)** young observer, Rajesh **Pandit** (Nepal) NR, Marloes **Peeters** (UK) young observer, Volker **Abetz** (Germany) guest, Lena **Horne** (Canada) guest, Song **Liu** (Canada) guest, Mario **Malincarnico** (Italy) NR SPT.

Saturday, 8.07.2017, 09:00-17:30

1. President's Introductory Remarks and Welcome for attendees, apologies for absentees

The Division President Greg Russell welcomed the Division members, observers and guests. Greg made a special note of the three young observers (**Jean-Luc Gardette, Pete Skabara, and Genevieve Sauve**) and first time attendees:

- **John B. Matson** (Virginia Tech, USA) – Young Observer
- **Myung-Han Yoon** (Gwangju Institute of Science and Technology, South Korea) – Macro2020 report
- **Du Yeol Ryu** (Yonsei University, South Korea) – SPT observer
- **Lena Horne** and **Song Liu** (University of Manitoba, Canada) – Macro2022
- **Adriana Sturvoca** (Prague Institute of Macromolecular Chemistry, Czech Republic) – report on UNESCO/IUPAC course and SPT observer
- **Chain-Shu Hsu** (National Chiao Tung University, Taiwan) – National Representative
- **Carlos Graeff** (São Paulo State University, Brazil) – SPT observer and Roger's BFF
- **Volker Abetz** (Universität Hamburg, Germany) – observer

2. Apologies for Absence

Absent members sent their apologies together with greetings to the Division, namely Carlos **Graeff**, Christine **Luscombe**, Stefano **Meille** (Valdo), Paola Carbone, Voravee Hoven, Stan Slomkowski, Taihyun Change (however sent two observers - *Duyeol Ryu and Myung-Han Yoon)*, Dick Jones, Alain Fradet, Philip Hodge, Stanislaw Penczek, Sabine Beuermann.

3. Approval of the Minutes of the Division Committee Meeting, Istanbul, July 2016

The (corrected) minutes recorded from the 2016 meeting in Istanbul, Turkey were accepted with unanimous acceptance by the division.

4. Macro2022 – Winnipeg Discussion (Lena Horne and Song Liu)

- Needed (letters of support for MACRO 2022)
- International Advisory Committee in place (McMaster University, University of New South Wales, Queen's University, University of Manitoba, Polymer Institute of the Slovak Institute of Science, SungKyunKwan University – South Korea, University of Washington, Carnegie Mellon, Cornell University
- There were questions about the venue (from Werner) include information about the venue in the slides, also there needs to be strong support for local committee – there needs to be polymer chemistry strengths "on the ground"
- Overall, there is support from the city of Winnipeg, University of Manitoba, and several Industrial & academic Communities across Canada

5. Announcements (Gregory Russell)

- Remembering our deceased - Michael Hess advises of death of Bob Fox (former DS) in Dec. 2016
- Polymer Division Officers – unchanged 2016 – 2019 (Greg Russell, Christine Luscombe, Michael Walter)
- Election of titular members (2016) Roger Hiorns, Paul Topham, Robin Hutchinson, Natalie Stingelin,

Igor Lacik, Yusuf Yagi, Chris Fellows

- Update on Project Applications – Recently approved (x3), Under consideration (x2), and in the pipeline (x2)
- Finances ($50k per 2 years – grant from center), mac. symp royalties ($1k per issue), 2015 take was US $7k
- Suggestions from the Secretary General (are there other practices around the Division operations that we might want to include in a guiding document? Also, we might want to include some stuff around the World Polymer Congress and how it relates to the off year meetings, or even around treatment of income from it. (Lastly, codify 4-year DP and DVP terms – should we have 4 year DP terms – **Yes!!**
- Needed – IUPAC Website Updater (Chris Fellows / Claudio do Santos or both)
- IUPAC 100 (project #**2016-024-1**) Mary Garson task-group chair, Chris Ober task-group members
- SPEd contributions to J. Chem Educ. Special (The Contribution of IUPAC to Polymer Science Education)

6. Report Subcommittee Polymer Terminology - SPT (Roger Hiorns)

- Terms are used by the international community (if companies can defend patents – they can reinvest (unknown industrial impact)
- Istanbul was a time to connect – a very stressful time, but an important time
- Back on track with new projects (we don't need more projects, but we do need have a strong completion of current projects) - Roger
- Funds are limited – Greg

6.1 Project Statuses (Nearing Completion)

2001-081-1-800 Terminology and Structure-Based Nomenclature of Dendritic and Hyperbranched Polymers –

2008-020-1-400 Fradet [in public review]

2008-020-1-400 Revision of the Division IV Web-based Terminology Guidelines – Hodge

2009-047-1-400 Stereochemical Aspects in Polymer Science – Hellwich & Moad

2010-036-1-400 List of Keywords – dos Santos & Slomkowski

2012-001-1-400 Terminology of Nanomaterials and Nanotechnology in Polymer Science – Ober & Jones

2003-060-2-400 Terminology on Separation of Macromolecules – Hess

6.2 Projects Running

2006-028-1-400 Terminology for Conducting, Electroactive and Field-responsive Polymers – Vohlídal

2010-007-1-400 Terminology for Chain Polymerization – Moad

2011-035-1-800 Terminology & Nomenclature of Inorganic & Coordination Polymers – Jones (collaborative project of Divisions II, IV & VIII)

2011-035-1-800 A Brief Guide to Polymer Terminology (Brief Terms) – Hiorns, Vohlídal

2013-048-3-400 Structure-based Nomenclature for Regular Star and Brush Polymers – Chen

2013-031-2-800 Terminology for modeling and simulation of polymers (ModSim) – Meille (was 2012-042-1-400)

2014-014-1-400 Terminology Relevant to Lactic Acid-based Polymers: Synthesis, Structure, Properties, Applications & Degradation – Vert

2014-033-1-400 Nomenclature for polymeric carriers bearing chemical entities with specific activities and names – Vert

2014-034-2-400 Brief Guide to Polymerization Terminology – Luscombe & Moad

2015-014-1-400 Guide (and Brief Guide) to Polymer Semiconductors – Walter

2015-050-3-400 Synchronising Wikipedia: Polymer Definitions and Terminology (PC) – Hess

2015-032-2-400 Definition of Terms Relating to the Ultimate Mechanical Properties of Polymers – Adhikari

6.3 Newly Started Projects

2016-018-1-400 Definition of Terms Pertaining to Polymers in the Solid State: Molecular Arrangement from the Nano- to the Micrometer Scale – Stingelin

2015-001-2-400 Terminology of Characterization – Topham

6.4 Submitted or to be Submitted Shortly

2016-xxx-x-400 Multilingual Glossary of Polymer Terminology: Stage II - Non Western Languages (PC) – dos Santos

6.5 Projects under discussion for submission:

- Additives intended to promote the degradation of polyolefin-based thermoplastic materials - Malinconico
- PB3 assembly - Jones
- hGp of PB2 – Moad
- Renewable and recycled polymers / polymer degradation – Vairon
- Polymers for Bioelectronics – Walter
- Polymers for 3D printng – Walter
- Ionic liquids/polymer inorganic devices – Ober
- Adhesion, adhesive polymers and associated terminologies – Vairon Evaluation of polymer crystals – Mielle
- Revision of the Brief Guide on Nomenclature - Hiorns

7.0 Subcommittee on Modeling of Polymerization Kinetics and Processes – report **Robin Hutchinson**

"As you will hold your Division and Committee meetings in São Paulo, I hope that the current and past due date projects will be reviewed and action taken. If projects will not be completed, we need to know we can to remove them (some very old start dates)."

Motivation for committee:

Modeling and mechanistic studies into free-radical polymerizations are important for science and industry, but often completely different model assumptions and parameter values are reported for ostensibly the same systems. The projects of the IUPAC Subcommittee "Modeling of Polymerization Kinetics and Processes" aim to rectify this situation through international collaboration, by producing critically evaluated kinetic parameters, whose values are reliable and which can be used by the international polymer community. Moreover, reliable methodologies have been established by the IUPAC Subcommittee.

Benchmark propagation rate coefficients, kp, have been obtained for styrene, many methacrylates, butyl acrylate, methacrylic acid, and vinyl acetate by critical evaluation and also by independent experiments. These efforts are currently extended to termination rate coefficients, initiation rate parameters, and reversible-deactivation radical polymerization kinetics.

Projects:

Project	*Leader*	*Budget*	*Remaining*	*Planned End Date*
2009-050-1-400	Moad	$5,300.00	$1,259.99	31-Dec-2017
2010-027-2-400	**Bertin**	**$1,000.00**	**$1,000.00**	**31-Dec-2013**
2013-045-1-400	**Hutchinson**	**$5,000.00**	**$5,000.00**	**1-Nov-2016**
2013-047-1-400	**Beuermann**	**$4,000.00**	**$4,000.00**	**1-Nov-2016**
2013-051-1-400	Russell	$6,000.00	$5,103.00	1-Nov-2017
2015-094-1-400	Kajiwara	$4,000.00	$4,000.00	31-Dec-2018

- Graeme pointed out that a meeting needs to be planned with a scientific *focus - p*erhaps develop Mini symposium at Paris on polymer dynamics and kinetics

8.0 International Year of Polymers – Polymer Division (Natalie Head IUPAC)

- Political decisions must be made by the chemical communities (with United Nations and Unesco support – keep looking into this possibility
- From **Natalia Tarasova** (at PD meeting on 8 July):
- Form a committee: call for volunteers ...
- She is happy to advise the committee
- Need support of several developing countries

9.0 Report Sub-Committee on Polymer Education – SPEd (Chris Fellows, Patrick Theato)

The structure of the SPEd is now:
Co-Chairs: Christopher Fellows (Australia), Patrick Theato (Germany
Elected Members: Rigoberto Advincula (USA), Choon Do (ROK), Claudio dos Santos (Brazil), Chan Chin Han (Malaysia), Jiasong He (PRC), Michael Hess (Germany), Dhanjay Jhurry (Mauritius), Richard Jones (UK), Christine Luscombe (USA), Graeme Moad (Australia), Gregory Russell (NZ)), Jiři Vohlídal (Czech), Michael Walter(USA)

Summary:
1. Educational Workshop in Polymer Science 2016 (Macro2016) 2. Skype meetings were held almost on a monthly basis
3. J. Chem. Ed. article published/accepted
4. Webpage is under our control
5. Article for Chemistry International submitted 6. Chris' project "Polymer Syllabus" submission
7. 25th PolyCHAR in October 2017

Discussion:
- new paper about the polymer education
- youngest subcommittee
- several new changes for the committee – to be confirmed
- Africa is still missing – Zimbabwe
- German Wikipedia doesn't like the IUPAC "box"

Interesting items: login that can be used to directly access the polymer education website

IUPAC Education Projects:

- **2012-027-3-400**, Enhancing Educational Website for Polymer Chemistry, C. Ober, ongoing
- **2015-032-2-400**, Synchronizing Wikipedia, Polymer Definitions and Terminology, M. Hess, ongoing
- **2015-046-1-400**, Postgraduate Course in Polymer Science, P. Kratochvil, ongoing
- **2015-057-1-400**, Educational Workshop in Polymer Sciences, C. H. Chan and C. M. Fellows, ongoing

To Do:
1. Multilingual Glossary (Claudio)
2. Macro2018 Poly education symposium (Chris)
3. Wikipedia Project (Michael)
4. Webpage transfer/update (Chris & Patrick)

- Outputs/publications Current since 2015
Hess, M. and Walker, M., Synchronizing Polymer Definitions and Terminology with Wikipedia , M. Hess and M. Walker, Chemistry International. 36(2), 19. DOI: 10.1515/ci.2014.36.2.19, March 2014
Macromolecular Symposia, 355, World Polymer Congress – MACRO 2014, Volume on Polymer Education, W. Mormann Ed.DOI: DOI: 10.1002/masy.201570035, September 2015 (17 publications, listed below)

Amornsakchai, T., University Polymer Education in Thailand. Macromol. Symp., 355(1), 82-89, (2015). doi: 10.1002/masy.201500038

Chan, C. H., and Ho, C.-C. Polymer Education of Public Universities in Malaysia. Macromol. Symp.,

355(1), 75-81, (2015). doi: 10.1002/masy.201500059

Do, C. H., and Theato, P. Update on Polymer Education in Korea. Macromol. Symp., 355(1), 68-74, (2015). doi: 10.1002/masy.201500088

dos Santos, C. G., Dias, M. L., and Canevarolo, S. V. Polymer Education in Brazil: Present Situation. Macromol. Symp., 355(1), 111-118, (2015). doi: 10.1002/masy.201500071

Edmonds, N. R., McKee, J., and Plimmer, P. N. Commercial Plastics: Tertiary Level Postgraduate Education in New Zealand. Macromol. Symp., 355(1), 39-42, (2015). doi: 10.1002/masy.201500035

Enlow, J. L., Marin, D. M., and Walter, M. G. Developing a Polymer Semiconductor Education Kit and Curriculum for High School Science Classrooms. Macromol. Symp., 355(1), 43-51, (2015). doi: 10.1002/masy.201500079

Fellows, C. M. Polymer Education in Australia. Macromol. Symp., 355(1), 104-110, (2015). doi: 10.1002/masy.201500066

He, J. Polymer Education in Institute of Chemistry, Chinese Academy of Sciences. Macromol. Symp., 355(1), 52-60, (2015). doi: 10.1002/masy.201500028

Hess, M. Conference Tutorials as Educational Tool in Polymer Science: The POLYCHAR Conference and Short Course. Macromol. Symp., 355(1), 26-31, (2015). doi: 10.1002/masy.201500044

Hiorns, R. C. Terminology and Nomenclature: A Prerequisite or Nuisance for Polymer Science Education? Macromol. Symp., 355(1), 13-19, (2015). doi: 10.1002/masy.201500052

Mormann, W. Polymer Education – A Matter at the Heart of the IUPAC Polymer Division. Macromol. Symp., 355(1), 8-12, (2015). doi: 10.1002/masy.201500094

Nakano, T. Polymer Education in Japan. Macromol. Symp., 355(1), 61-67, (2015). doi: 10.1002/masy.201500019

North, A. M. Teaching from Polymer Molecular Structure to Technological Properties; Requirements in Developing Countries. Macromol. Symp., 355(1), 32-38, (2015). doi: 10.1002/masy.201500037

Pasch, H. Polymer Science Education – A (Southern) African Perspective. Macromol. Symp., 355(1), 96-103, (2015). doi: 10.1002/masy.201500029

Šturcová, A., and Kratochvíl, P. UNESCO/IUPAC Postgraduate Course in Polymer Science – Prague, Czech Republic. Macromol. Symp., 355(1), 20-25, (2015). doi: 10.1002/masy.201500016

Theato, P., Polymer Education in Germany. Macromol. Symp., 355(1), 119-125, (2015). doi: 10.1002/masy.201500055

Van Thu, L., Van Khoi, N., and Tung, N. T. Polymer Education in Vietnam. Macromol. Symp., 355(1), 90-95, (2015). doi: 10.1002/masy.201500068

10.0 Subcommittee on Structure and Properties of Commercial Polymers – report (He)

• Founded in 1963, it works in a manner to ensure that the projects are structured as to accommodate value in application, need and scientific novelty within the broad field of structure and properties of commercial polymers.
• Now 65 members from 10 countries:
1/3 from industry and 2/3 from academy.
• Publications 95, including 58 in Pure Appl. Chem.
• Four current running projects.
• A long list of 13 feasibility studies in the pipeline.
• Logistically western (European) chapter and eastern (Asian) chapter
in 2017, meetings in Poland and China
in 2018, meetings in UK and South Korea

- Commercial polymers – characterizing, crystallinity, deformation, wear, and facture
- Next meetings August 2017 and 2018
- Subcommittee since 1963!! 50 years in 2013
- Why are there no Americans or Australians? This group is heavily addressed into the industry

Publications since Istanbul Meeting:

- Y. Lu, Y. Wang, R. Chen, J. Zhao, Z. Jiang, Y. Men*, Cavitation in Isotactic Polypropylene at Large Strains during Tensile Deformation at Elevated Temperatures, Macromolecules*, 48(16), 5799-5806 (2015)*
- D. Kalapat, Z.-L. Li, Q.-Y. Tang, X.-H. Zhang, W.-B. Hu*, Comparing crystallization kinetics among two G-resin samples and iPP via Flash DSC measurement, J. Thermal Analysis & Calorimetry*, 128, 1859–1866 (2017)*
- E. A. Andablo-Reyes, D. Auhl, E. L. de Boer, D. Romano, S. Rastogi, A study on the stability of the stress response of nonequilibrium ultrahigh molecular weight polyethylene melts during oscillatory shear flow, Journal of Rheology, 61, 503 (2017)

11.0 WCC 2019 presentation – 100th anniversary of IUPAC (Evolution of Chemistry) – Details about the WCC Paris Meeting

"Chemistry is the art of matter"
- first row transition metals will now take over the majority of catalysis
- big – noncovalent assemblies will be very useful

2.00 – 3 pm: visit by IUPAC Secretary General (Richard Hartshorn) comments:

(sustainability from the scientific view), getting plans for new members and succession plans in place for people taking on leadership roles (young observers)

(organizational development), green chemistry – sustainability

(evaluate what we are doing right or can be better at doing) – reviewing the activities of divisions and make sure we are well-structured and well-organized

- Issue 1 – money (key issue – sustainability of the IUPAC)

12.0 Division 4 report to ICTNS (Grame Moad)

Publications of Division 4 since Busan
Subcommittee on Polymer Terminology – publications all appear in PAC

'*Definitions of terms relating to individual macromolecules, macromolecular assemblies, polymer solutions, and amorphous bulk polymers (IUPAC Recommendations 2014)'*, R. Stepto, T. Chang, P. Kratochvíl, M. Hess, K. H orie, T. Sato, J. Vohlídal, *Pure Appl. Chem*. **2015**; *87*(*1*): 71–120.

'*Nomenclature and graphic representations for chemically modified polymers (IUPAC Recommendations 2014)*' , R. G. Jones, T. Kitayama, E. S. Wilks, R. B. Fox, A. Fradet, K.-H. Hellwich, M. Hess, P. Hodge, K. Horie, J. K ahovec, P. Kratochvíl, P. Kubisa, E. Maréchal, W. Mormann, C. K. Ober, R. F. T. Stepto, M. Vert, J. Vohlídal, *Pure Appl. Chem*. **2015**; 87(3): 307–319.

'*Source-based nomenclature for single-strand homopolymers and copolymers* (IUPAC Recommendations 2016)', R. G. Jones, T. Kitayama, K.-H. Hellwich, M. Hess, A. D. Jenkins, J. Kahovec, P. Kratochvíl, I. Mita, W. Mormann, C. K. Ober, S. Penczek, R. F. T. Stepto K. Thurlow, J. Vohlídal, E. S. Wilks, *Pure & Appl. Chem.*, **2016**, *88*, 1073-1100.

'*Source-based Nomenclature for Single-Stand Homopolymers and Copolymers (IUPAC Recommendations 2016)*', R. G. Jones, T. Kitayama, K.-H. Hellwich, M. Hess, A. D. Jenkins, J. Kahovec, P. Kratochvíl, I. Mita, W. Mormann, C. K. Ober, S. Penczek, R. F. T. Stepto, K. Thurlow, J. Vohlídal, E. S. Wilks, *Pure Appl. Chem*. **2016**. https://doi.org/10.1515/pac-2015-0702

Some earlier documents are appearing as unauthorized translations in Croatian.

2015 Hess M, Allegra G, He J, Horie K, Kim JS, Meille SV, Metanomski V, Moad G, Stepto RFT, Vert M, Vohlídali J. Glossary of terms relating to thermal and thermomechanical properties of polymers (IUPAC recommendations 2013) | Glosar naziva vezanih uz toplinska i termomehanička svojstva polimera (IUPAC-ove

preporuke 2013.) *Kemija U Industriji/Journal of Chemists and Chemical Engineers*. **2015**, 64, 263-282. DOI: 10.15255/KUI.2014.004

Terminology for aggregation and self-assembly in polymer science (IUPAC recommendations 2013) | Nazivlje z a agregiranje i samoudruživanje u znanosti o polimerima (IUPAC-ove preporuke 2013.) *Kemija U Industriji/Jou rnal of Chemists and Chemical Engineers*. **2015**, *64*, 611-632. DOI: 10.15255/KUI.2014.009KUI-36/2015

Subcommittee on Polymerization Kinetics and Modelling – publications seldom appear in PAC or go through ICTNS (sometimes a summary publication will)

"SEC Analysis of Poly(Acrylic Acid) and Poly(Methacrylic Acid)" I. Lacík, M. Stach, et al., Macromol. Chem. Phys. 216, 23-37 (2015).

"Critically Evaluated Rate Coefficients in Radical Polymerization – 8. Propagation Rate Coefficients for Vinyl A cetate in Bulk" C. Barner-Kowollik, S. Beuermann, M. Buback, R. A. Hutchinson, T. Junkers, H. Kattner, B. M anders, A. N. Nikitin, G. T. Russell, A. M. van Herk, , Macromol. Chem. Phys. 218, 1600357, 2017

Subcommittee on Industrial Polymers – Publications do not appear in PAC and do not pass through ICTNS.
[93] Y. Lu, Y. Wang, R. Chen, J. Zhao, Z. Jiang, Y. Men*, Cavitation in Isotactic Polypropylene at Large Strains during Tensile Deformation at Elevated Temperatures, *Macromolecules*, 48(16), 5799-5806 (2015)
[94] D. Kalapat, Z.-L. Li, Q.-Y. Tang, X.-H. Zhang, W.-B. Hu*, Comparing crystallization kinetics among two G-resin samples and iPP via Flash DSC measurement, *J. Thermal Analysis & Calorimetry*, 128, 1859–1866 (2017)
[95] E. A. Andablo-Reyes, D. Auhl, E. L. de Boer, D. Romano, S. Rastogi, A study on the stability of the stress response of nonequilibrium ultrahigh molecular weight polyethylene melts during oscillatory shear flow, *Journal of Rheology*, 61, 503 (2017)

Subcommittee on Polymer Education – Publications do not appear in PAC
'The Contribution of IUPAC to Polymer Science Education' Chin Han Chan, Christopher M. Fellows, Michael Hess, Roger C. Hiorns, Voravee Hoven, Gregory T. Russell, Claudio G. dos Santos, Adriana Sturcova, Patrick Theato. J Chem Ed., 2017. http://dx.doi.org/10.1021/acs.jchemed.6b00800

The following projects were initiated within SPT.

Project 2011-013-2-400 Updating Wikipedia – Hess. Published through numerous Wikipedia pages now carryin g IUPAC definitions (sometimes paraphrased). The IUPAC definitions are contained in non-editable text boxes.

Project 2007-008-1-400 Multilingual Encyclopedia – dos Santos. Comprises translations of terms appearing the *Glossary of Basic Terms in Polymer Scienc*e that appears in the Purple Book. Projects is being extended to cove r additional languages.

Published as a Multilingual Polymer Glossary at: http://www.iceb.ufop.br/dequi/iupac/polymerglossary/index.p hp

Polymer Division Conference Proceedings – Recommended to appear in Macromolecular Symposia. The Polymer Division receives funds from Wiley based on volumes published. Proposed to make publication Macromolecular Symposia mandatory in order to receive IUPAC sponsorship.
Tan, L. Negahban, M. (editors) *POLYCHAR 23 – World Forum on Advanced Materials*. Wiley-VCH: Macromolecular Symposia. 2016; Vol. 365, pp 1-267.
Mormann, W. (editor) *World Polymer Congress – MACRO 2014 Volume on Polymer Education*. Wiley-VCH: Macromolecular Symposia. 2015; Vol. 355, pp 1-125.
Chirachanchai, S.; Hoven, V.; Sojamsang, W. (editors) *Macro 2014*. Wiley-VCH: Macromolecular Symposia. 2015; Vol. 354, pp 1-383.
May be others.
Purple Book. It is intended to put forward a project on a html edition of the Purple Book which would retain the text and formatting of the current Purple Book but include hyperlinks to definitions and Figures within the volume. The Purple Book is a compilation of papers that have been published in PAC. The possibility of incuding addition chapters based on publications that have appeared since the Purple Book is contemplated.

Some of these replace Chapters in the existing Purple Book.

The current Purple book is now freely available from the IUPAC web site as a single pdf file: http://www.iupac.org/fileadmin/user_upload/publications/e-resources/ONLINE-IUPAC-PB2-Online-June2014.pdf

2017 conferences endorsed

1. 14th Annual UNESCO/IUPAC Workshop and Conference on Macromolecules & Materials, April 10 - 13, 2017, Stellenbosch, South Africa (Chairman: Prof B Klumperman), pending
2. APME 2017 - 12th International Conference on Advanced Polymers via Macromolecular Engineering, May 21 -25, 2017, Ghent, Belgium (Chairman: Prof. Filip Du Prez), pending
3. European Polymer Congress 2017, July 2 - 7, 2017, Lyon, France (Chairman: Prof. Jean-Francois Gerard), pending
4. 9th International Symposium Molecular Mobility and Order in Polymer Systems, June 19 - 23, 2017, Saint Petersburg, Russia (Chairman: DrS.A.A.Darinskii), pending
5. Macro- and supramolecular architectures and materials (MAM-17): Multifunctional materials and structures, June 6 - 10, 2017, Sochi, Russia (Chairman: Prof. Eduard Karakhanov), pending
6. International Conference on Novel Materials and their Synthesis, October 14 - 19, 2017, Changsha, China (Chairman: Prof. Yuping Wu), pending
7. POLYCHAR 25 - World Forum on Advanced Materials and 25th Annual Tutorial on Polymer Characterization, October 09 – 14, 2017, Kuala Lumpur, Malaysia (Chin Han Chan)

13. Minutes of 1st Interdivision Meeting of Polymer (Div IV) and Chemistry and Human Health Division (Div VII) held at 11.20 am on Sunday, 9 July 2017 at Room Miró. (Chan Chin Han)

No	Present	email
	In person	
1	A. Ganesan (VII)	a.ganesan@uea.ac.uk
2	Francesca Giuntini (VII)	F.Giuntini@ljmu.ac.uk
3	Geok Bee The (VII)	sharonteh2009@gmail.com
4	Graeme Moad (IV)	Graeme.moad@csiro.au
5	Greg Russell (IV)	greg.russell@canterbury.ac.nz
6	Jean-Pierre Vairon (IV)	jean-pierre.vairon@upmc.fr
7	Marloes Peeters (VII)	m.peeters@mmu.ac.uk
8	Melissa Chin Han Chan (IV)	cchan_25@yahoo.com.sg
9	Michel Vert (IV)	vertm@univ-montp1.fr
10	Natalie Stingelin (IV)	natalie.stingelin@mse.gatech.edu
11	Patrik Theato (IV)	theato@chemie.uni-hamburg.de
12	Roger C. Hiorns (**Chair**) (IV)	roger.hiorns@univ-pau.fr
13	Tamaki Nakano (IV)	tamaki.nakano@cat.hokudai.ac.jp
14	Thomas Perun (VII)	TJPerun@aol.com
15	Vladimir Gubala (VII)	v.gubala@kent.ac.uk
16	Volker Abetz (IV)	volker.abetz@hzg.de

Item	Matters Discussed	Action by
1.1	Roger (in the chair) as the Chairperson of Subcommittee on Polymer Terminology (SPT) welcomed everyone for the interdivision meeting. He mentioned that the roles of SPT are to develop terminology and nomenclature on polymer sciences.	Info
1.2	Michel and Chris Ober have been the contact persons between Divison IV and Division VII. So far, one successful project was completed.	Info
1.3	Greg as the President of Division IV shared the roles and responsibilities of four subcommittees under Polymer Division, i.e.	Info

Item	Matters Discussed	Action by
	(1) Subcommittee on Polymer Terminology (2) Subcommittee on Polymer Education (3) Subcommittee Structure and Properties of Commercial Polymers (4) Subcommittee on Modeling of Polymerization Kinetics and Processes	
1.4	Thomas Perun, the Chair of Division VII, introduced the roles and responsibilities of three subcommittees under Division VII. (1) Subcommittee on Nomenclature for Properties and Units (SC-NPU) (2) Subcommittee on Drug Discovery and Development (3) Subcommittee on Toxicology and Risk Assessment Major aspects of Division VII are the development of therapeutic drugs, the standardization of clinical laboratory methods and the protection of humans from potential harmful substances.	Info
2.1	Natalie shared the opinion that there has been communication gap between Division IV and Division VII.	Info
2.2	Vladimir Gubala suggested that more works have to be carried out on polymer toxicology. Natalie gave the opinion that common nomenclature on biology works should be adopted for polymer scientists and biologists.	Info
2.3	Vladimir Gubala expressed his concern on the interchanged terminology on "association", "aggregation" & "agglomeration" on nanomaterials. Many people are using polymers with lacking of knowledge on polymer sciences. For examples, the difference between PEG and PEO.	Info
3.1	Roger suggested that initiatives should be made on "IUPAC recommendation" instead of brief guide.	Info
3.2	Three projects were initiated and should call for further refinement of concept, they are:- (1) Polymer of Relevance to Human Health Natalie to lead with proposed members of Michael Schwenk, Vladimir, Grame, Linda Johnston and Paul Topham (2) Terminology of Polymer Biodegradation and Toxicology in Polymer Valdimir to lead (to kick start a project document) with proposed members of Natalie, Marloes, Michel, Francesca, Harald Krug and Luc Gardette	Natalie & Valdimir
4.1	Michel suggested the members involved in new project may refer to:- Pure &Appl. Chem., Vol. 68, No. 12, pp. 2313-2323, 1996 Definitions of Terms Relating To Degradation, Aging, and Related Chemical Transformations of Polymers	Info
5.1	Roger suggested that further discussion can be made on interdivision projects during closing meeting of SPT on Thursday, 13th July 2017 in Matisse room.	Roger
6.1	There being no other matters, the meeting was adjourned at 12.05 pm.	

14. PolyCHAR details (Chan Chin Han)

1. Advance biological, biomedical and environment-friendly polymers
2. Electroactive polymers
3. Latex chemistry and technology
4. Materials for clean and sustainable energy
5. Multi-techniques of materials characterization
6. Nanomaterials and smart materials
7. Natural and synthetic elastomers
8. Polymer and nutrition
9. Polymeric gels and soft matter
10. Processing, rheology and mechanical properties

MACRO 2018

With topics in the fields of:-

(1) polymer synthesis (2016)
(2) characterization (2017)
(3) **applications (2018)**

(4) processing (2019)
The focus on each educational workshop is shifted from (1) to (4) each year.

15. UNESCO/IUPAC Postgraduate Course in Polymer Science – report (Sturcova)

Overview: Students attend courses for economically disadvantaged countries, 10 month course, course participants work on a project, attend lectures on polymer chemistry/physics, they give three talks (research before attending the institute, progress report half way, and at the end they give a 20 minute presentation)

Funded by long term funding – between 10-13 students, mentoring students – acknowledge IUPAC support.

July 9th, 2017 – IUPAC Division IV

16. Interdivisional Sub-committee on Materials Chemistry (C. K. Ober and N. Stingelin) - ISMC

- ISMC is very interdisciplinary
- Knowledge of interdisciplinary activities between different divisions not very strong
- Seemed to be opportunity to combine interdivisional workshop and Young Observer events in WCLM to support goals of ISMC
- at the same time ICGCSD came into existence - working with ICGCSD on WCLM
- Interdisciplinarity became theme of WCLM

Future: Still need support from Polymer Division, there is opportunity for new funding streams for projects

17. General Remarks (Russell)

- Question: are all these conferences promoting Polymer Division well?
Is there sufficient dissemination of IUPAC (in the Americas)
Michael Hess – make a requirement for publication in the
macromolecular symposia (money is an important source of funding)

- Quality of the IUPAC endorsement of a symposium or conference

- Review process for the conference – to change and improve the quality of the conference.

- Should we enforce publishing in Macromolecular Symposium for including the IUPAC label at the conference??

Vote: they must to agree to publish a volume in macromolecular ***15 in favor, 4 against, 9 abstain.***

17.1 Other reports (Extra-Divisional Appointments)

- Roger on Pure and Applied Chemistry (impact up over 2.0)
- Some special items in the works for IUPAC 100
- more reviews in the future
- Carlos Tollinche – Chemical Research Applied to World Needs (CHEMRAWN)
- Conference in Italy, Roma – solid waste - we have to see what comes out about the new committee
- Graeme Moad – ICTNS rep. – standards advisory board
- Anything published should have the IUPAC stamp of approval
- Ongoing requirement for the purple book (updated maybe every 10 years or similar)
- electronic version of the purple book (faster publication of recommendation)

Div. IV Extra-Divisional Appointments 2017

- **Bureau**: Chris Ober (elected), Greg Russell (Division President)
- IUPAC Standing Committees:
  - Chemical Research Applied to World Needs (**CHEMRAWN**, chair Carlos Tollinche): Ram Adhikari (NR), Mario Malinconico (NR)
  - Committee on Chemistry and Industry (**COCI**, chair Bernard West): Robin Hutchinson (Division representative)

- Committee on Publications and Cheminformatics Data Standards (**CPCDS**, chair Bonnie Lawlor): Cláudio dos Santos (Division representative)
- Committee on Chemistry Education (**CCE**, chair Mustafa Sözbilir): Chris Fellows (AM), Ram Adhikari (NR), Supawan Tantayon (Division member)
- Interdivisional Committee on Terminology, Nomenclature and Symbols (**ICTNS**, chair Ron Weir): Graeme Moad (Division representative)
- Project Committee (**PC**, chair Doug Templeton): Chris Ober (member)
- Evaluation Committee (**EvC**, chair Richard Hartshorn): not represented

• Other:
- **Div. VIII** (Chemical Nomenclature and Structure Representation): Karl-Heinz Hellwich (TM-Pres), Phil Hodge (TM), Jiří Vohlídal (TM)
- *Pure and Applied Chemistry* Editorial Advisory Board (**PAC-EAB**) : Jung-Il Jin (TM), Roger Hiorns (Division representative)
- **CCRF** (Committee on Chemical Research Funding): Chris Ober (member as Bureau rep, but will also represent the PD)
- **IUPAC Solvay Award Committee**: Greg Russell (member)
- Interdivisional Subcommittee on Materials Chemistry (**ISMC**): Chris Ober (chair until GA 2017), Natalie Stingelin (member)
- **(Sub)committee on Green Chemistry** (became inter-divisional in April 2016 at Montreal, used to reside in Div. III [Organic]): Christine Luscombe (member); Supawan suggested to join too
- **International Scientific Committee** for the UNESCO-PhosAgro-IUPAC Programme (related to Green Chemistry): Sabine Beuermann (Division representative)

17.2 Awards

- Another Stepto Plenary Lecturer for MACRO 2018?
- Vote for the plenary lecturer? Yes?
- What is the point of award – for instance what is the distinction (broaden the appeal of awards)
- Large, and transparent as possible (Roger Hiorns)
- To reach more people (have the NAO to nominate people) Claudio
- Greg proposes that he will form a little committee of folks to sort out – advertisement or no advertisement (all people or just developing countries)

Michael Hess, Michael Walter, Ray Buchar, Roger Hiorns, Chris Fellows, Claudio

18.0 Interdivisional Report (Roger Hiorns)

Two interdivisional meetings (nomenclature 8 and 7 Health)
Mostly spt business

- decided to go forward with 4 projects (projects that will actually be useful and actually work
- graphical representation, assembled nomenclature, polymer sequencing, polymer electronic notation (Andre) – for better searching – might key in with Ray Bucher (leader, team members)

- 2nd meeting with Health (two projects) – 1st. project polymers of relevance to human health, terminology of biodegradation – biologically active polymers

- Challenge to Roger – two applications in two year's time!

- Should we still have interdivisional meetings?

- Yes – keep them however, keep them Sunday morning before division meeting (then have the debriefing) – 9 am. (the more people the better)

19.0 International Year of Polymers 2020 – discussion (Stingelin)

Polymer science was born in 2020 – year of Macromolecules (UNESCO – Year of Polymers)

- IUPAC should do all the work – or at least get most of the planning going.

- Natalie/Jiasong was enthusiastic for this idea – 2020
- Michael Buback contacted German Chemical Society (GDCh)
- Natalya IUPAC president – 2019 for WCC 150th anniversary of the periodic table, however they don't want IYP to jeopardize the international year of the periodic table – UNESCO designated year.
- Definitive evidence of an application for international year of polymers – not available

Committee for IYP – PD 8 July

- Natalie is happy to advise the committee
- To get the application through UNESCO – we need to get developing countries involved.
- Malaysia, Thailand, Brazil, Nepal
- Get information from Natalie about EPF
- Germans will support it, but are hesitant
- UNESCO sees that all of IUPAC is supportive of the IYP
- Resources from IUPAC? We need to have a specific plan!!!
- If you'd like to be apart of it contact Natalie

Mario, Igor, Claudio, Mellissa, Patrick, Paul, Olga, Michael, Melissa, Tamaiki, Natalie, Christine

The have initiated the letter – the commission for the Russian Federation approved – and the UNESCO federation has gone ahead and sent it in.

20. MACRO 2018 Update (Chris Fellows)

- Questions: Lena Horne – registration fees – it would be clearer to say Australian dollars.
- Patrick: there are only standard fees, no IUPAC discount? The Australian academy of science (membership discounts or other scientific agency) – we would like to see preferential prices for IUPAC members
- Price is perceived to be a bit higher – especially for students – a bit too high?
- Something should be done to lower the price for students and the social functions too
- contact the organizing company and figure out the breakdown of the cost for each registration
- We are trying to attract students and faculty from developing countries
-

21. MACRO 2020 Update (Myung-Han Yoon)

Technical Sessions:

- Recent Developments in Polymer Synthesis
- Polymer Characterization by Convergence Techniques
- Polymer Physics and Theory
- Polymer Engineering and Processing
- Smart and Functional Polymers
- Self-Assembly and Nanostructuring of Polymers
- Biopolymers and Biomedical Engineering
- Energy and Environmental Applications
- Electrical and Optical Applications

Many advantages for it being held at the International Convention Center – Jeju Island

- 7th ranking for international conferences in Asia
- 17th ranking for international conferences in the world
- world-class resort style convention facilities
- popular resort destination, easy access from all over the world

22. MACRO 2024 (potential sites)

- Are the dates flexible?
- Do the organizers of the Warrick Conference agree to this?
- What are the size of former MACRO conferences – is there enough room for having it at Warrick (enough accomodations?)
- 1600 rooms on campus reserved (examine old MACRO numbers)
- Positive endorsement from the Polymer Division
- MACRO 2026 (Auckland Convention Center) – center hasn't been built yet.

23. Closing remarks (Greg Russell)

"IUPAC has to stand for quality, rigor and consensus. If one has good people, then all this will follow. By good people I not only mean intelligent, knowledgeable, personable and passionate people, but perhaps even more importantly I mean selfless people who are given to serving others rather than seeking self-gain, be it financial or reputational. IUPAC strategy must be underpinned by an understanding of this, in which context it is also important to remember without fail that IUPAC work is "for love not money."

- Michael Walter (Division Secretary), June 2018